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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/559,391	12/06/2005	Jae-gwan Lee	29137.123.00	9069
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MCKENNA LONG & ALDRIDGE LLP 1900 K STREET, NW WASHINGTON, DC 20006			EXAMINER BERNSHTEYN, MICHAEL	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/559,391	Applicant(s) LEE ET AL.	
	Examiner MICHAEL M. BERNSHTEYN	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☒ Claim(s) 1 and 3 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/06/2005</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

1. Claims 1 and 3 are objected to because of the following informalities: claim 1, line 1 contains space in the word "by"; claim 3, lines 3 and 4 also contains several spaces, which should be deleted. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hieda et al. (U. S. Patent 6,448,354) in view of Fujita et al. (U. S. Patent 5,153,283).

With regard to the limitations of claim 1, Hieda discloses that a methyl methacrylate syrup produced in the presence of an anti-foaming agent, which comprises (A) 39 to 90% by weight of a monomer component mainly comprising **methyl methacrylate**; (B) 9 to 60% by weight of a polymer component derived from methyl methacrylate or a monomer mixture mainly comprising methyl methacrylate, the polymer component having a weight average molecular weight of 20,000 to 500,000 when measured by gel permeation chromatography; (C) **0.0005 to 3.0% by weight of at least one chain transfer agent** selected from the group consisting of mercaptans having 4 to 20 carbon atoms; (D) 0.0001 to 0.3% by weight of at least one anti-foaming agent selected from the group consisting of partially esterified compounds derived from aliphatic carboxylic acids having 1 to 30 carbon atoms and glycerin and polymers derived from a monomer mixture mainly comprising butadiene; and (E) **0.001 to 1.0% by weight of a hindered phenol polymerization inhibitor**, the total of the percentages adding up to 100% by weight (col. 6, lines 48-67).

With regard to the limitations of claims 1 and 3, Hieda does not disclose the usage of component (d) a tertiary amine cocatalyst.

Fujita discloses that the amine hydrohalide and quaternary ammonium halide used in this invention include, for example, hydrohalide salts (e.g. hydrochloride, or hydrobromide) of primary, secondary or **tertiary amines** of an alkyl group having 1 to 16 carbon atoms, an aryl group having 6 to 8 carbon atoms and/or an aralkyl group having 7 to 8 carbon atoms, such as n-amylamine, n-hexylamine, n-octylamine, n-decylamine, laurylamine, palmitylamine, dibutylamine, tributylamine, **N,N-dimethyl-p-toluidine**, phenethyldibutylamine, N,N,N',N'-tetramethylhexamethylenediamine, N,N,N',N'-tetramethyl-propylenediamine, etc. The amine hydrohalide or quaternary ammonium halide is usually used in an amount of 0.005 to 1 part by weight, preferably 0.01 to 0.5 part by weight, per 100 parts by weight of the monomer or syrup thereof, which is within the claimed range (col. 3, line 54 through col. 4, line 9).

Both references are analogous art because they are from the same field of endeavor concerning methods for producing (meth)acrylate syrup.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate quaternary ammonium halide, e.g., tertiary amine, such as N,N-dimethyl-p-toluidine as taught by Fujita in Hieda's method for producing (meth)acrylate syrup with reasonable expectation of success because in this case the polymerization reaction can proceed rapidly and stably and thereby there is obtained a polymer having excellent mechanical strength with less coloring, which is useful for the production of optical parts because the polymer thus prepared has far less internal strain (US'283, col. 5, lines 21-27), and thus to arrive at the subject matter of instant claims 1 and 3.

With regard to the limitations of claim 2, Hieda discloses that usable polymerization initiator in the polymerization at about 100⁰C may be lauroyl peroxide, benzoyl peroxide, etc. (col. 11, lines 1-5).

With regard to the limitations of claim 4, Hieda discloses that the polymerization is preferably 95 to 110⁰C under atmospheric pressure, and more preferably the boiling point of the mixture in the reaction system. The polymerization heat can be removed by sensible heat or vaporization latent heat. The sensible heat can be set in a wide range by conducting the polymerization at 110 to 180⁰C, which is mainly within the claimed range (col. 11, lines 22-27).

With regard to the limitations of claim 5, Hieda discloses that the weight ratio of the initial charge and the after-charge is preferred to be within the above range to maintain the refluxing amount constant throughout the addition when a polymerization rate of 15 to 50% is intended, which is within the claimed range (vol. 10, lines 22-25).

3. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto et al. (JP 11-228645) in view of Hieda et al. (U. S. Patent 6,448,354).

With regard to the limitations of claim 1-3, Takemoto discloses a method for obtaining an acrylic syrup composition comprises (A) at least one of (meth)acrylate ester selected from acrylic esters and methacrylic esters, (B) a metacrylic ester macromonomer that is soluble in the component (A), (C) a plasticizer soluble in the component (A), (D) a compound of having at least two polymerizable bonds in one molecule and (E) a polymerization initiator containing a peroxide and a tertiary amine (abstract).

With regard to the limitations of claim 1, Takemoto does not disclose the usage of component (b) a chain transfer agent

Hieda discloses the usage of 0.0005 to 3.0% by weight of at least one chain transfer agent selected from the group consisting of mercaptans having 4 to 20 carbon atoms (col. 6, lines 48-67).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a chain transfer agent in the claimed range as taught by Hieda in Takemoto's method for producing (meth)acrylate syrup because it has been known that a mercaptan used as the chain transfer agent promotes the bulk polymerization (US'354, col. 9, lines 39-41), and thus to arrive at the subject matter of instant claim 1.

4. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto et al. (JP 11-228645) in view of Hieda et al. (U. S. Patent 6,448,354) as applied to claims 1-3 above and further in view of Takizawa et al. (JP 2000-313704).

The disclosure of Takemoto and Hieda's references resided in § 3 is incorporated herein by reference.

With regard to the limitations of claims 4 and 5, Takisawa does not disclose a peak exothermic temperature within the initiation of the polymerization and the conversion rate.

With regard to the limitations of claim 4 and 5, Takizawa discloses a **bulk polymerization** of polymerizable unsaturated bond-bearing monomers mainly comprising acrylic alkyl esters, a reaction mixture in which **0.0001-0.5 pts.wt. of a**

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polymerization initiator having 10 hours of the half-life temperature per 100 pts.wt. of a monomer bearing a polymerizable unsaturated bond is homogeneously admixed, and their temperature is adjusted to 20-80°C to start the polymerization reaction in the reaction mixture. After the start of the polymerization, the maximum temperature of the reaction mixture is attained in the range of **from 100-140°C** by utilizing the self-heating of the reaction system as the polymerization initiator is consumed and **15-50 wt.%** of the monomer bearing a polymerizable unsaturated bond used in the polymerization are polymerized. According to this invention, an acrylic alkyl ester or the like can be bulk-polymerized under control (abstract). As the initiators, peroxy neodecanoate, di-n-peroxy dicarbonate, etc. are disclosed (pages 7-8, [0022]).

Both references are analogous art because they are from the same field of endeavor concerning methods for producing (meth)acrylate syrup.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust a peak exothermic temperature within the initiation of the polymerization and the conversion rate within the claimed ranges as taught by Takisawa in Takemoto's method for producing (meth)acrylate syrup with reasonable expectation of success because in this case it is possible to provide the method for stably proceeding the polymerization by substantially using no solvent and using a thermally decomposition type polymerization initiator without uncontrollability of polymerization reaction (JP'704, abstract), and thus to arrive at the subject matter of instant claims 4 and 5.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL M. BERNSHTEYN whose telephone number is (571)272-2411. The examiner can normally be reached on M-Th 8-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael M. Bernshteyn/
Examiner, Art Unit 1796

/M. M. B./
Examiner, Art Unit 1796